

BORDERLESS INTERCONNECTION PROCESS

ABSTRACT

[0053] A new method for fabricating a borderless interconnection in a semiconductor device is provided. During fabrication, the device includes an interlevel dielectric (ILD) layer, a metal silicide layer, and a stop layer disposed between the ILD and metal silicide layers. The stop layer may be formed of silicon nitride or silicon oxynitride, and the metal silicide layer may be a nickel silicide. The method includes etching the ILD layer to expose at least a portion of the stop layer and then performing a nitrogen plasma treatment on the exposed portion of the stop layer. After the treatment, the exposed portion of the stop layer is removed to provide the interconnection hole. Because of the plasma treatment, damage to the metal silicide underlying the stop layer will be minimized when the stop layer is removed.